

CLAIMS

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1. A method of reducing zones of high tensile stress in the surface of a part comprising the steps of:  
selecting a region of the part to be treated; and  
exerting pressure against the surface of the selected region, the pressure being applied such that the magnitude of compression decreases in the direction towards the boundaries of the selected region.
  2. The method of Claim 1 wherein the pressure being exerted against the surface of the part is performed by a burnishing operation.
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3. The method of Claim 1 wherein said pressure being exerted on the surface of the part induces a deep layer of compression within the surface having associated cold working of less than about 5.0 percent.
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4. The method of Claim 1 wherein said pressure being exerted on the surface of the part induces a deep layer of compression within the surface having associated cold working of less than about 3.5 percent.
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5. The method of Claim 1 further wherein the step of selecting the magnitude of compression includes the step of programming a control unit to automatically reduce the magnitude of compression in the direction towards the boundaries of the selected region.

7.  
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The method of Claim 1 wherein the step of exerting pressure against the surface of the selected region includes the step of programming a control unit to control the application of said pressure.

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The method of Claim 2 wherein the burnishing operation includes varying the burnishing density along the boundaries of the selected region.

8. The method of Claim 1 wherein the part is selected from the group consisting of automotive parts, aircraft parts, marine parts, engine parts, motor parts, machine parts, drilling parts, construction parts, and pump parts.

9. A method of reducing high tensile stress zones in the surface of a part comprising the steps of:  
selecting a region of the part to be treated; and  
programming a control unit of a burnishing apparatus to perform a burnishing operation, the burnishing operation being performed such that the density of burnishing and the magnitude of compression are varied to reduce the high tensile stress along the boundaries of the selected region

10. The method of Claim 9 wherein said burnishing operation induces a deep layer of compression within the surface having associated cold working of less than about 5.0 percent.

11. The method of Claim 9 wherein said burnishing operation induces a deep layer of compression within the surface having associated cold working of less than about 3.5 percent.